

## Meridional Flow Variations in Cycles 23 and 24: Active Latitude Control of Sunspot Cycle Amplitudes

David H. Hathaway NASA/Marshall

Lisa Upton Vanderbilt University and The University of Alabama, Huntsville

We have measured the meridional motions of magnetic elements observed in the photosphere over sunspot cycles 23 and 24 using magnetograms from SOHO/MDI and SDO/HMI. Our measurements confirm the finding of Komm, Howard, and Harvey (1993) that the poleward meridional flow weakens at cycle maxima. Our high spatial and temporal resolution analyses show that this variation is in the form of a superimposed inflow toward the active latitudes. This inflow is weaker in cycle 24 when compared to the inflow in 23, the stronger cycle. This systematic modulation of the meridional flow should also modulate the amplitude of the following sunspot cycle through its influence on the Sun's polar fields. The observational evidence and the theoretical consequences (similar to those of Cameron and Schussler (2012)) will be described.

Komm, Howard, and Harvey (1993) *Solar Phys.* 147, 207.

Cameron and Schussler (2012) *Astron. Astrophys.* 548, A57.